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Presents a thorough review of the information about the pelagic organism decline. Conceptual models used to organize and synthesize evidence related to decline of pelagic organisms in the Delta (Delta smelt, threadfin shad, longfin smelt, striped bass).

A weight of evidence approach is used to determine cause and effect for drivers (stressors).

Conceptual models were developed for the system overall and for each of the four species showing how the drivers impacted on the system and each species.

Drivers are organized into 4 categories: 1. Previous abundance; 2. Habitat (physical and chemical); 3. Top down (predation and harvest/entrainment); 4. Bottom up (food chain effects).

An initial triage approach seeking to rule out individual drivers was unsuccessful – we now have evidence that all investigated drivers may have played a role in the POD. The multi-driver origin of the POD is an important insight. However, it is not particularly helpful to policy makers and managers seeking guidance for management strategies aimed at reversing the POD declines. The POD management team has used two other approaches to evaluating drivers.

The first approach focused on how the major drivers differ for each of the four POD fish species, and how they differ in relative importance during different life history stages or seasons. The second approach seeks to understand the POD in the context of an ecological regime shift affecting the entire estuarine ecosystem and explores the effects of changing drivers through several historical periods leading up to the POD. In this conceptual model, drivers are distinguished based on their approximate rate of change and their importance to ecological resilience. We hypothesize that drivers that changed slowly over decades (slow drivers) contributed to the slow erosion of ecological resilience of the system. This made the system more vulnerable to the effects of drivers that changed more rapidly around the time of the POD.

The overall model and individual species models have evolved over time and will continue to evolve as new information comes available. The original overall model is now being replaced by a regime shift kind of model. The evolving nature of the conceptual models, points to the uncertainty inherent in any analysis of stressor/driver effects.

With multiple drivers and multiple species it becomes apparent that no single model can account for the declines of all the POD species. Looking for the single or simple set of management measures to reverse the POD is unproductive.